CHAPTER 3
RESEARCH METHODOLOGY
The present research has paid more emphasis to measure service quality and customer satisfaction of DTH service providers in Himachal Pradesh. In order to achieve the research objectives of the present study, systematic and scientific approach was adopted. This chapter addresses the need of study, scope of the study and the research design followed. The research design includes proper arrangement of various components such as universe, sample, research instrument, method of data collection and analysis tools, etc.

3.1 Definition of the Problem

The formulation of a correct research problem is the first and most important step in the total research process. It is the imperative stage in applied research because poorly defined problem will not yield useful outcomes. A poorly defined problem may lead to lots of confusion and does not allow the researcher to build up a good research design. The present study can be entitled as:

A study on service quality and customer satisfaction in paid Direct To Home service providers in Himachal Pradesh.

3.2 Need and Importance of the Study

The present research work, i.e., A study on service quality and customer satisfaction in paid Direct To Home service providers in Himachal Pradesh has given more emphasis to measure service quality and customer satisfaction of Direct To Home service providers in Himachal Pradesh. On the basis of the results of this study, companies can enhance level of customer satisfaction by improving quality of their service.

In future, quality is the key for the sustained growth of the Direct To Home (DTH) industry. However, quality cannot be limited to products and brands alone. Successful Direct To Home (DTH) service providers are required to embed quality in every aspect of their functioning, ranging from products and processes to people, system and business partners. Service quality can lead to competitive advantage for the innovator organization for a much longer period. Thus, service quality is a critical issue for the Direct To Home (DTH) sector.
Further, the study appears as importance because of following aspects:

1. The growth of Direct To Home (DTH) industry in India.
2. No detailed studies undertaken with regard to Direct To Home (DTH) sector.
3. One of the least explored research area.

3.3 Scope of the Study

The present study has a great scope. The study has been carried out at selected areas of Himachal Pradesh. For studying the customer satisfaction and service quality providing by Direct To Home (DTH) service provider, six paid DTH operators (Airtel digital TV, Dish TV, Reliance Digital TV, Sun Direct, Tata Sky, and Videocon d2h) were selected. The study was conducted to analyze the service quality and customer satisfaction, compare the service quality perception and investigate the effects of service quality on selected behavioural outcomes, i.e., ‘propensity to recommend’ and ‘switching intention’.

3.4 Research Methodology

Research planning facilitates the smooth sailing of the various research operations and provides an outline within which the goals of research are to be achieved. Planning makes research as efficient as possible, yield maximal information with minimum expenditure of time, efforts and money. The plan and procedure of any study is bound up with its purpose. The major purpose of this research was to study the relationship between service quality and customer satisfaction of Direct To Home (DTH) service providers in Himachal Pradesh. Research methodology concerns with relevant data collection from representative sample, applying appropriate tools and techniques, analysis and interpretation of collected data for the scientific investigation of the problem.

3.4.1 Research Design

Research design is an arrangement of conditions for collection, analysis and interpretation of the data in a manner that intends to combine, relevance to the purpose of the research in a most economical way. It facilitates the smooth sailing of the diverse research operations by making research as efficient as possible yielding
maximum information in most economic way. In brief, it can be said that research design consists a clearly defined research problem, procedures and techniques used by researcher to collect information, population to be studied and method to be used in data analysis. Research design can be conveniently described into different categories and given as follow:

3.4.1.1 Exploratory Research Design

Exploratory research studies mainly emphases the discovery of ideas and insights. The main purpose of such research is to formulate a problem for more precise investigation or to develop a working hypothesis from an operational point of view. This research is conducted for a problem that has not been defined very clearly. Exploratory research is employed when problems are in a preliminary stage and relies mainly on secondary research studies such as reviewing existing available literature and data. Thus, it can be said that exploratory or formulative research design is used when the problem or issue is new and when data is difficult to collect. It is flexible and can address different types of research questions (how, what and why).

3.4.1.2 Descriptive Research Design

Descriptive research design is concerned with unfolding the characteristics of a particular individual, or a group. It mainly addresses the ‘what” question and its main objective is to conduct such research which can describe the things, such as demographics and attitude of consumers or can determine market potential for any product. It is also known as statistical research, which describes the data and characteristics about what is being studied. In this research frequency, average and other statistical calculations are made which provides more accurate and better results. In descriptive research, researcher has tried to make an attempt to explore the existing phenomenon. For descriptive studies, research design is rigid and must follow the given steps:

I. Formulate the research objectives
II. Determine data collection methods
III. Selecting the sample for the research or sample and sampling techniques
IV. Data collection
V. Data Analysis and Interpretation
VI. Finding and Report writing
In case of descriptive studies, to construct a research design researchers have to consider the points mentioned above and must be prepared on keeping in view the objectives and the resources available.

3.4.1.3 Experimental Research Design

The research work organized to test the hypotheses of causal relationship between variables is known as experimental studies and the research design developed for such studies is known as experimental research design. Here, an orderly procedure is followed with the goal of verifying, refuting or establishing the validity of a hypothesis. It requires those procedures that not only reduce biasness and increase reliability, but allow researcher to draw inferences about causality. So, it can be said that an experimental design provides the framework or the structure of an experiment for achieving the objectives of a study.

The present study is descriptive in nature and aims at describing the nature of the variables and their distribution. The study is survey based having definite objective, planning, analysis and interpretation of the data collected and meaningful reporting of the results. The research was designed to examine the relationship between service quality and customer satisfaction and for this, the descriptive-survey method was used, in addition to this, the techniques of correlation analysis and multivariate analysis were used together. This research work was aimed at finding out the relationships between the two constructs, so, it can be said that we have utilized a co-relational approach to conduct the study.

3.4.2 Universe for the Study

The present study was carried out in the state of Himachal Pradesh having 12 districts named as Bilaspur, Chamba, Hamirpur, Kangra, Kinnaur, Kullu, Lahul and Spiti, Mandi, Shimla, Sirmaur, Solan and Una. In present time, there are seven DTH service providers proving their services all over the state. A telephonic survey was conducted with the sales executives of different DTH companies which resulted that district Kangra is having maximum DTH users followed by Solan at second place and Shimla at third (Source: telephonic interview with various sales executives of different DTH companies in Himachal Pradesh). Accordingly, the DTH users in these districts of the state constituted the study population.
3.4.3 Sample Design and Sample Size

The present research, “A Study on Service Quality and Customer Satisfaction in Paid Direct To Home Service Providers in Himachal Pradesh” has given more emphasis to measure service quality and customer satisfaction of Direct To Home (DTH) Service Provider in Himachal Pradesh. The statements for the study were identified and refined by a pilot study and is used to collect adequate data to reach research objectives. There are total seven DTH service providers in the state named as Airtel digital TV, Dish TV, Reliance Digital TV, Sun Direct, Tata Sky, Videocon d2h (all six are private service providers) and one Government owned operator DD Direct Plus. For the present study, since price was considered as important determinants, therefore, only six paid DTH service providers (Airtel digital TV, Dish TV, Reliance Digital TV, Sun Direct, Tata Sky, and Videocon d2h) were selected. Further, it also reduces the variance and leads to formation of a homogenous group of respondents from selected three districts of the state.

In order to select the final respondents, the approach has to go through various steps. First of all, three districts i.e., Kangra, Solan and Shimla having maximum subscribers of Direct To Home (DTH) services were selected. In evidence of reviewed studies, it was found that many researchers have used convenience sampling technique in their research on service industry, Vaid (2009), Kalia (2008), so, in second step, on the behalf of this ground, a sample of 1000 respondents from different areas of the three districts was selected with convenient sampling keeping in view their access to Direct To Home (DTH) services for the study and explaining in detail the relation to the study purpose of the present research work. Siddiqui (2013) stated that sample size of 1000 respondents is sufficient to conduct a research successfully. A personal-contact approach followed by personal visits and telephone calls has been used to get high response rate. Respondents have been asked to contact researcher freely, if they are faced with any difficulty in responding to the questionnaire.

3.4.4 Data Collection

The study was based on both primary as well as secondary data. Secondary data included review of existing literature on service quality, reports of the government organizations and companies, magazines, various journals and websites
of various national and international institutions. Primary data for the research was collected with the help of well structured questionnaire, specially designed to achieve research objectives.

For the primary data, a survey was conducted and respondents were asked questions to assess their perception of various statements or items of different constructs, including factors viewed as antecedents of service quality, customer satisfaction and behavioural response. All statements were measured on the Five Point Likert Type Scale from 1 (strongly disagree) to 5 (strongly agree). A survey was conducted after the Pilot Study had identified and refined statements used in this study.

3.5 Development of Questionnaire

The following procedure has been followed to develop the questionnaire for the present study:

3.5.1 Specification of the theoretical construct
3.5.2 Construction of the preliminary questionnaire
3.5.3 Pre-Testing of the preliminary draft of questionnaire
3.5.4 Purifying the questionnaire
3.5.5 Final draft of the questionnaire
3.5.6 Refinement and validation of the questionnaire

3.5.1 Specification of the Theoretical Construct

A comprehensive review was given on the literature available on service quality and behavioural intension to establish preliminary bounce to construct and to develop the scale for the research. In the following paragraphs, major components of the present research instrument are described briefly.

3.5.1.1 Perceived Quality

This study mainly focused on to identify the relationship between service quality and customer satisfaction in Direct To Home (DTH) sector. To begin, an inventory of service quality statements were identified. Parasuraman, et al. (1988) has operationalised service quality by using five components having 22 items widely
known as SERVQUAL instruments and in general research scholars and practitioners seem to agree on the validity of this scale to measure service quality (Parasuraman and Grewal, 1988). However, the completeness of the SERVQUAL scale in accessing the critical dimension of service quality is a subject of further investigation (Angur, et al., 1999). Concept of service quality is industry and country specific, Cooper and Schindler (2006). Thus, it is important to construct a questionnaire to measure the service quality perception of DTH users.

For Direct To Home (DTH) services perceived service quality included:

3.5.1.1 The items that represent the five dimensions of service quality described by Parasuraman, et al. 1991 (a).

3.5.1.2 Added items that required covering of extra dimension of service quality specific to the Direct To Home (DTH). Existence of cultural differences between countries and regions strengthen the importance of building additional dimensions of service quality in the Indian Direct To Home (DTH) industry.

3.5.1.3 Some more additional items from other service sectors like telecommunication, banking, insurance and business services.

In order to add the extra items, literature and studies on Direct To Home (DTH) sector and other services were studied. Rajput and Sharma (2012) have analysed the general perception of customer about Direct To Home (DTH) services and applied five dimension of “SERVQUAL” and two additional dimensions “convenience” and “network quality” in their study. Madan, et al. (2012) used “SERVQUAL” instrument for exploring customer satisfaction and to identify the gap between customers’ perception and customers’ expectation to Direct To Home (DTH) services. Some more additional items were identified by investigating the literature on some other sectors. Richter and Dvorak (1988) have identified five dimensions of service quality for communication services. Westbrook and Peterson (1998) have laid a strong theoretical foundation for understanding the consumer perception about service quality in a business-to-business setting. They have found some additional variables of service quality and listed twelve service quality dimensions. They have considered Price one of the most important determinants of service quality. Kalia
(2008) conducted a study on telecom user at Chandigarh on the basis of seven dimensions of service quality. Her study consist of assurance, reliability, tangibles, empathy, responsiveness, network quality, and others factors including recharge facility, awareness of the new plans and services offered and facility provided by service providers for bill payments. Sandhu and Bala (2011) used seven dimensions named as proficiency, media and presentations, physical and ethical excellence, service delivery process and purpose, security and dynamic operations, credibility, and functionality, to measures customers’ perception towards service quality. Khan and Raj (2013) confirmed assurance, reliability, tangibles, empathy, responsiveness, network quality, convenience, price, and other factors, as dimensions of DTH service quality. Therefore, it can be said that network quality, price and convenient to use Direct To Home (DTH) service plays an important role in determining customers perception of the overall service quality in the Direct To Home (DTH) services.

Service operations also plays very significant role in the success of any service provider. Service operations consist of many activities that are organized to help the customer to utilize the service in better way which enhance their satisfaction level in turn. Companies have to organize various activities to ensure high performance of its operations, such as, the use of information technology to inform and serve customers better, to provide them facilities for payments and security in financial transactions. It refers to the ability of the DTH service provider to aware the customer about new services and plans, to provide adequate facilities of recharge, and to ensure an accurate billing system to their subscribers. It is also very important to provide the sufficient information about the new services and plans to the customers on time, so that they can make the best use of their money and avail the services according to their choice. Next considerable thing is to strengthen the facilities to get account recharge where customers can make payments. It is also important to make customers feel safe and secure in their transactions, and it is possible only by building billing system accurate. For example, DTH service providers are awaring their customers about the new plans and services by various tools such as making calls to avail running or upcoming offers. Service providers have to focus on this dimension to make best use of money, provide better options for money payments and to make customers feel safe and secure in transactions. Therefore, it can be said that Service operations involve customer’s awareness about the new service and plans offered,
accurate billing system of services availed, and provide conveniences for the payment of bills along with recharge facilities are also very important factors to determine the service quality of Direct To Home (DTH) services. In the present research, dimension of other factors is termed as service operations.

Combining the research work by Parasuraman, et al., (1985), Zeithaml et al., (1990), SERVQUAL, Westbrook and Peterson (1998), Gronroos (2000), Kalia (2008), Rajput and Sharma (20012), Sandhu and Bala (2011), and Khan and Raj (2013), it was agreed that service quality of DTH services should be evaluated using nine service quality dimensions: assurance, reliability, tangibles, empathy, responsiveness, network quality, convenience, price and service operations that includes adequate recharge facilities, accurate billing system, awareness about new products and services.

So, it can be conclude that for the present research assurance, reliability, tangibles, empathy, responsiveness, network quality, convenience, price, and service operations used as dimensions of service quality in DTH sectors. Thus, the nine dimensions which were used to conceptualize the Direct To Home (DTH) service quality are:

1. Assurance: It represents the employee’s knowledge and courteousness and the ability of service provider to develop the sense of trust and confidence.
2. Reliability: it is the ability of the service provider to perform the promised service both dependably and accurately.
3. Tangibles: Tangible represents the appearance of physical facilities, personal communication material and equipment that service providers provided or used.
4. Empathy: It means the accessibility and efforts taken to understand customer’s needs or problems. It also defined as the ability to provide caring, individualized attention that service provider provides.
5. Responsiveness: It is the willingness of the service provider to help and to make available prompt service to the customers. This dimension of service quality stress upon the attentiveness and promptness in dealing with customer complaints, requests, questions and problems.
6. Network Quality: Network quality is the technical efficiency of service provider to provide high network coverage, picture and sound clarity with no signal breakage and work in bad weather conditions.

7. Convenience: It represents the ability of Direct To Home (DTH) service provider to offer the services that require less time and fewer efforts to acquire and utilize.

8. Price: It is the amount of money charged from the customers for make use of Direct To Home (DTH) services and to meet with budget objectives of the subscribers.

9. Service Operations: It refers to ability of the DTH service provider to aware the customer about new services and plans, to provide adequate facilities to recharge, and to ensure an accurate billing system to their subscribers.

For all these nine dimensions having twenty nine statements were framed to evaluate the service quality of their Direct To Home (DTH) service provider. Statements representing various aspects of the 9 service quality dimensions were generated to form the initial pool for the present study. This process resulted in the generation of nine DTH service quality dimensions with 29 statements. An overview of the 9 DTH service quality dimensions and their underlying statements is given in table A3.3.1 (refers to Appendix-III).

Table A3.3.1 represents the 9 preliminary dimensions with 29 statements of DTH service quality. For the present study, all these are the preliminary dimensions of service quality for DTH services.

3.5.1.2 Customer Satisfaction: In the present study, customer satisfaction was operationalised by four statements which are related to service quality and product quality etc. provided by Direct To Home (DTH) service provider. Five Point Likert Type Scale, ranging from strongly disagree to strongly agree was used to rate the levels of satisfaction of respondents. Respondent’s overall satisfaction score was calculated by combining his or her score on four items.

3.5.1.3 Behavioural Intentions: In order to investigate the effects of service quality on selected behavioural outcomes, i.e., ‘propensity to recommend’ and ‘switching intention’, total seven statements were used to measure behaviour intensions in terms
of recommending and switching. To do this, five-point scale was used and a composite score was obtained by summing respondent’s response to the four statements in terms of switching intensions and three statements in terms of propensity to recommend behaviour. These measurements have frequently been utilized in both academic and practitioners’ studies on satisfaction (Brown, et al., 1993).

3.5.1.4 Complaining Behaviour: For the present research, customers’ complaining behaviour was operationalised by asking questions relating to complaints. Three statements were used for predictive inference of future behaviour of customers rather than mere post-dictive explanation of past behaviour.

Five Point Likert Scale: - Respondents were asked to evaluate their Direct To Home (DTH) service provider on twenty nine statements. Five Point Likert Type Scale from 1 (strongly disagree) to 5 (strongly agree) was used to measure all statements.

3.5.2 Construction of Preliminary Questionnaire

A set of total twenty nine statements was constructed for the nine dimensions of service quality, four statements were constructed for overall customer satisfaction, three for recommending behaviour, four for switching intensions and three statements were constructed for complaining behaviour. Table 3.2 shows the dimensions and its corresponding statements in the preliminary draft in the research instrument. Following criteria was kept in mind while framing and editing the statements.

3.5.2.1 The statements were short as well as written in simple language.
3.5.2.2 Double-barrelled statements are avoided.
3.5.2.3 Only those statements, which reflect the construct for which the scale sets out to measure, were included in the research instrument.
3.5.2.4 In order to make the statements clear to the respondents, these were written in simple English language.
Table 3.2
Preliminary Draft of the Questionnaire

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Dimension</th>
<th>Statements</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assurance</td>
<td>1,2,3,4</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Reliability</td>
<td>5,6</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Tangibility</td>
<td>7,8,9,10</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Empathy</td>
<td>11,12,13</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>Responsiveness</td>
<td>14,15</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>Network Quality</td>
<td>16,17,18,19,20</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>Convenience</td>
<td>21,22,23,24,</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>Price</td>
<td>25,26</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>Service Operations</td>
<td>27,28,30</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>Recommending Behaviour</td>
<td>1,2,3 of part III</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>Switching Intentions</td>
<td>31,32,33,34</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>Customer Satisfaction</td>
<td>29 and 1,2,3 of part II</td>
<td>4</td>
</tr>
<tr>
<td>13.</td>
<td>Complaining Behaviour</td>
<td>35 of part I , 4 and 5 of part III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>

Table 3.2 represents the preliminary draft of the questionnaire which was Pre-Tested on an appropriate sample. *(Refers to Appendix-IV for Preliminary Questionnaire)*

3.5.3 Pre-Testing of the Preliminary Draft of Questionnaire

Preliminary drafted questionnaire was pre-tested by conducting a small pilot study to ascertain how well the questionnaire works. In order to identify and eliminate potential problems, pre-testing of the preliminary questionnaire was done on a sample of respondents. During pilot study, all aspects of the questionnaire were tested on a sample of 25 respondents. In pre-testing, respondents selected for the pilot study were similar to those who were included in the actual survey in terms of familiarity with the topic, background characteristics, and attitude and behaviour of interest.

3.5.4 Purifying the Questionnaire

In the present research work, questionnaire was purified by applying the factor analysis. Normally, factor analysis is applied to the situation where the relations between latent and observed variables are unknown or certain. Factor analysis illustrates the relationships between the observed and latent variables and proceeds in an exploratory manner to reveal the underlying factors. The main purpose to apply this approach is to expose the minimum numbers of factors that will elucidate the co-
variation among the observed variables. Thus, factor analysis is a data reduction technique and used to determine the actual numbers of factors underlying the construct by reducing the number of variables. Before applying the factor analysis on the data, a visual inspection of the correlation matrix anti-image matrix has been made to examine whether the data was suitable for factor analysis or not. Bartlett’s test of sphericity and KMO measure were further analyzed. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index which point out the proportion of variance in variables which is a common variance. Large value (close to 1.0) indicates that factor analysis is useful and in case value less than 0.50, factor analysis won’t be very useful with the data. Bartlett’s test of sphericity is used to test the hypothesis that that correlation matrix is an identity matrix, which would signify that variables are unrelated and therefore suitable for structure decision. Very small values (less than 0.05) indicate the relationships among variable are significant data is fit for factor analysis. For the present study, Bartlett’s test of sphericity indicates that correlation matrix is considerably different from identity matrix in quality scale, recommending scale, switching intension scale, customer satisfaction scale and complaining behaviour scale. Table 3.3 to table 3.7 illustrates the value of KMO test and Bartlett’s test of sphericity for the above scales. It can be seen from all these tables that Bartlett’s test of sphericity was significant and KMO measure of sampling adequacy was greater than 0.5 which indicated that factor analysis was appropriate for the research instrument.

3.5.4.1 Application of KMO and Bartlett’s Test of Sphericity

In order to determine the actual dimension of Direct To Home (DTH) service quality, factor analysis was used after applying KMO and Bartlett’s test of Sphericity were applied.

<table>
<thead>
<tr>
<th>Quality Scale: KMO and Bartlett’s Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>KMO Measure of Sample Adequacy</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
</tr>
<tr>
<td>Df</td>
</tr>
<tr>
<td>Sig.</td>
</tr>
</tbody>
</table>
Table 3.4  
**Recommending Scale: KMO and Bartlett’s Test**

<table>
<thead>
<tr>
<th>KMO Measure of Sample Adequacy</th>
<th>0.643</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>19.612</td>
</tr>
<tr>
<td>Df</td>
<td>3</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 3.5  
**Switching Intension Scale: KMO and Bartlett’s Test**

<table>
<thead>
<tr>
<th>KMO Measure of Sample Adequacy</th>
<th>0.566</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>19.024</td>
</tr>
<tr>
<td>Df</td>
<td>6</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 3.6  
**Customer Satisfaction Scale: KMO and Bartlett’s Test**

<table>
<thead>
<tr>
<th>KMO Measure of Sample Adequacy</th>
<th>0.687</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>47.910</td>
</tr>
<tr>
<td>Df</td>
<td>6</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 3.7  
**Complaining Behaviour Scale: KMO and Bartlett’s Test**

<table>
<thead>
<tr>
<th>KMO Measure of Sample Adequacy</th>
<th>0.623</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>9.341</td>
</tr>
<tr>
<td>Df</td>
<td>3</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000</td>
</tr>
</tbody>
</table>

It is clear from the tables 3.3 to 3.7 that Bartlett test of sphericity was significant in all five scales and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was higher than 0.5, which confirm appropriateness of preliminary research instrument appropriate for factor analysis.
3.5.4.2 Application of Factor Analysis

In order to underline key dimensions for the questionnaire, principle component factor analysis with a varimax rotation was applied on above mentioned scales. Factor Analysis and Cronbach’s Alpha was applies on Quality Scale as shown in table A5.3.8 (refers to Appendix-V).

### Table 3.9
Recommending Scale: Factor Analysis and Cronbach’s Alpha

<table>
<thead>
<tr>
<th>Dimension and Statement</th>
<th>Factor Loading</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propensity to recommend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You will say positive thing about your Direct To Home (DTH) service provider to other people.</td>
<td>0.734</td>
<td></td>
</tr>
<tr>
<td>You would strongly recommend this Direct To Home (DTH) service provider to someone who seeks your advice.</td>
<td>0.781</td>
<td></td>
</tr>
<tr>
<td>You would encourage your friends and relatives to choose this Direct To Home (DTH) service provider.</td>
<td>0.530</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3.10
Switching Intensions Scale: Factor Analysis and Cronbach’s Alpha

<table>
<thead>
<tr>
<th>Dimension and Statement</th>
<th>Factor Loading</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching Intensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>You will take some of your usage to a competitor that offers better price.</td>
<td>0.929</td>
<td></td>
</tr>
<tr>
<td>You will pay a higher price than competitors charge for the benefits you currently receive from your DTH service provider.</td>
<td>0.678</td>
<td></td>
</tr>
<tr>
<td>You would like to switch to a competitor if you experience a problem with the DTH services.</td>
<td>0.647</td>
<td></td>
</tr>
<tr>
<td>You would not shift to some other DTH service provider even if it offers better deals in terms of price.</td>
<td>0.840</td>
<td></td>
</tr>
</tbody>
</table>
To identify the final statements for the Questionnaire, Factor Loading and Cronbach’s Alpha were applied. The factor structure explained 66.33 percent, 68.15 percent, 77.33 percent, 71.55 percent and 72.91 percent of the variance in statements of quality scale (66.33%), recommending scale (68.15%), switching intension scale
(77.33%), customer satisfaction scale (71.55%) and complaining behaviour scale (72.91%).

All statements of a scale strongly loaded on one factor and weakly on all Operations, thereby satisfying the requirements of convergent and discriminant validity. Finally, factor analysis resulted out the final statements that make up each dimension, factor loading, and the reliability coefficient in the table A5.3.8 (Appendix-V) to table 3.12. Table A5.3.8 represents 29 final statements for service quality scale, table 3.9 consist of three statement for recommending behaviour, table 3.10 contained four statements for switching intensions, table 3.11 shows four for customer satisfaction and table 3.12 represents three statements for complaining behaviour.

3.5.5 Final Draft of the Questionnaire

After purifying and selecting statements of the questionnaire (research instrument), the final draft of the research instrument was prepared in table no. 3.13 that shows the statements on the quality scale, customer satisfaction scale, and behavioural intension scale.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Dimension</th>
<th>Statements</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assurance</td>
<td>1,2,3,4</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Reliability</td>
<td>5,6</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Tangibility</td>
<td>7,8,9,10</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Empathy</td>
<td>11,12,13</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>Responsiveness</td>
<td>14,15</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>Network Quality</td>
<td>16,17,18,19,20</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>Convenience</td>
<td>21,22,23,24</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>Price</td>
<td>26,27</td>
<td>2</td>
</tr>
<tr>
<td>10.</td>
<td>Recommending Behaviour</td>
<td>1,2,3 of part III</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>Switching Intentions</td>
<td>33,34,35,36</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>Customer Satisfaction</td>
<td>30 and 1,2,3 of part II</td>
<td>4</td>
</tr>
<tr>
<td>13.</td>
<td>Complaining Behaviour</td>
<td>41 of part 1, 4 and 5 of part III</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>

The final questionnaire was developed and consisted four parts. In the first part, there are thirty five statements, in second part three and in third part five statements are lying.
Part I: Part I of the questionnaire consisted total of thirty five statements, out of which twenty nine statements were directed to nine dimensions of service quality, four to switching intensions, one on customer satisfaction and one to complaining behaviour.

Part II: This second section II of the questionnaire consisted total of three questions on satisfaction of respondents.

Part III: This part consisted total of five statements out of which three were on recommending behaviour and two were on complaining behaviour.

Part IV: Part IV of the questionnaire addressed the issues related to know the personal and other characteristics of the respondents and their suggestions for implements in Direct To Home (DTH) services. This section sought to reveal the demographic information about the respondents’, i.e., age, gender, educational qualification, monthly income, marital status, current profession, etc.

The final questionnaire is shown in Appendix-VI. The research questionnaire has been refined many times based on the comments and suggestions of the experts and on the finding of pilot study. Final questionnaire has been developed and designed in order to specially address the issues of Direct To Home (DTH) sector and maximally investigate all the aspects of service quality, customer satisfaction and required dimensions of behavioural intensions.

3.5.6 Refinement and Validation of the questionnaire

The development of a good measure to obtain valid and reliable estimates of the construct is a critical aspect in the evolution of a fundamental theory in any management concept. In order to standardize the measurement scales and ensure they truly measure that what they intend to measure, reliability and validity of the research instrument were tested.

3.5.6.1 Reliability Analysis

Reliability analysis of the questionnaire was done before the analysis of the results and to establish the reliability of instrument many measures of reliability such as test rested method, internal consistency method, equivalent forms and split halves
method can be used. Out of all these methods, the internal consistency method requires only one administration and consequently is believed to be most effective, mainly in field studies. Moreover, for reliability analysis, this method is considered to be the most general form that operationalised reliability as internal consistency, which is the degree of inter-correlation among the various statements constituted in scale. To estimate internal consistency, a reliability coefficient called “Cronbach’s alpha” was used. A reliability values of 0.60 to 0.70 and above are considered by many researchers as acceptable (Cooper & Schindler, 2006; Malhotra & Birks, 2006). The alpha value of 0.60 or more is considered to be the criteria for representing internal consistency of new scales and established scales respectively. Cronbach’s coefficient alpha was used to determine the reliability of the measurement. For present survey questionnaire, there were five performance dimensions (service quality, propensity to recommend, switching intentions, customer satisfaction and complaining behaviour) being measured by using multiple statements on a five point Likert scale. Service quality was measured with nine dimensions, named as Assurance, Reliability, Tangibles, Empathy, Responsiveness, Network Quality, Convenience, Price, and Service Operations. As in table A5.3.8 (Appendix-V) to table 3.12, value of Cronbach’s alpha was found more than 0.6, so, it can be said that all the values exceeded the minimum requirements and showing that all dimensions have acceptable reliability values and are internally consistent.

3.5.6.2 Validity Analysis

A scale or a construct is valid to the extent that it measures what it intends to measure. Validity can be expressed as a degree to which a concept and its measure attain theoretical and empirical meaning within the overall structure of one’s theory. For assessing the psychometric soundness of a scale, different form of validity can serve as criteria. For the present study, face validity, content validity, convergent validity, discriminant validity and nomological validity were used to perform validity analysis.

3.5.6.2.1 Face validity: Face validity is the mere appearance that a measure is valid, Kaplan and Sacuzzo (1993). To analysis the face validity, one looks at the scale and sees whether “on its face” it appears a good reflection of the construct. For the present study, all the constructs service quality, customer satisfaction, behavioural intention
were identified from the literature, their selection is justified thereby confirming the face validity of the research instrument.

3.5.6.2.2 Content Validity: Content validity of a research instrument is the degree to which it provides an adequate representation of the theoretical domain that it is designed to cover. Apart from face validity, it is the only form of validity for which the evidence is logical and subjective rather than statistical, Kaplan and Sacuzzo (1993). If the statements representing the various constructs of a questionnaire are supported by a comprehensive review of relevant literature, content validity can be ensured, Bohrnstedt (1983). The development of present research instrument has been based on the comprehensive analysis of the prescriptive, conceptual, practitioner and empirical literature. Moreover, the thorough review by experts (both academic and practitioners) has ensured the content validity of the research instrument.

3.5.6.2.3 Convergent Validity: Convergent validity analysis pertains to the extent which the scale statements supposed to represent a construct do in fact “converge” on the same construct. Coefficient of Cronbach’s alpha has been used to measure the reliability and it also reflects the degree of cohesiveness among the scale statements and is an indirect indicator of convergent validity. Table A5.3.8 to table 3.12 represent the fairly high values of coefficient- alpha for the nine dimensions have proven reliability of the scale and further confirmed its convergent validity.

3.5.6.2.4 Discriminant Validity: Discriminant validity of a questionnaire is the degree to which it is not similar to (or diverges from) other questionnaire that are theoretically not similar to others (Fornell and Larcker, 1981). Discriminant validity could be proven only if following criteria is verified: when the statements of the two different instruments, i.e., Direct To Home Service Quality (DTHSQ) versus service quality (SERVQUAL), both measures should diverge. Since the construct of perceived service quality in general and the perceived quality in the Direct To Home (DTH) services are not sufficiently different. Therefore, SERVQUAL was close to DTHSQ to provide an adequate test for discriminant validity.

3.5.6.2.5 Nomological Validity: The Nomological validity of a research instrument could be verified only if, it was possible to validate empirically the association between the focal construct (i.e., perceived service quality in the Direct To Home
service or DTHSQ) and other constructs to which it is supposed to be related theoretically. For the present study, such constructs were:

3.5.6.2.5.1 Whether the customer is satisfied with the Direct To Home (DTH) services.
3.5.6.2.5.2 Whether he/she would recommend the Direct To Home (DTH) service provider to a friend or relative and
3.5.6.2.5.3 Whether he/she has ever had problems with the Direct To Home (DTH) service provider.

3.6 Statistical Techniques Used

In the present study to make certain conclusions regarding the hypothesis framed, the following statistical tools were employed for analysis of data.

3.6.1 Descriptive Analysis: To study the nature and distribution of the scores on various study variables, measure of central tendency, such as mean, standard deviation, etc. were carried out.

\[
\text{Mean} = \overline{X} = \frac{\sum X_i}{n}
\]

Standard Deviation = \(\sigma = \sqrt{\frac{\sum f_i (X_i - \overline{X})^2}{\sum f_i}}\)

3.6.2 Correlation Analysis: The use of correlation analysis has been made to analyze the relationship between the independent and the dependent variables. Correlation Coefficient is a real number that exists between -1 to 1.

\[
\text{Correlation} = r_s = 1 - \left[ \frac{6 \sum d_i^2}{n(n^2 - 1)} \right]
\]

3.6.3 ANOVA (F-Test): ANOVA (F test) was used to compare the service quality perception across the DTH service providers.

3.6.4 Regression Analysis: Regression analysis is used to predict the value of one variable (independent) on the basis of other variables (dependent). It involves developing a mathematical equation that describes the relationship between independent variable and dependent variable.
3.6.4.1 **Multiple Regression:** The multiple regression analysis was used to find out the relative contribution of each of the nine dimension influencing: (a) Overall service quality (b) Overall customer satisfaction (c) Propensity to recommend one’s most used Direct To Home (DTH) service (d) Switching intentions of the Direct To Home (DTH) users.

Multiple regression is a statistical technique that allows us to predict someone’s score on one variable on the basis of their scores on several other variables. In multiple regression there are various methods such as Enter, Stepwise, Forward and Backward methods etc. that can be used to predict the explanatory variables. Stepwise is one of the most sophisticated of these statistical methods.

3.6.4.2 **Stepwise Regression Analysis:** Stepwise regression is a very useful tool when dealing with explanatory variables. In this method, we made an attempt to find best regression model without testing all possible regressions. In stepwise regression, variables are either added or deleted from regression model at each step in the model development process and ends with the selection of best fitting model where no variable can be included or excluded from the last fitting model. In the model, nine dimensions of service quality dimensions taken as independent (explanatory or predictor) variables and service quality as the dependent (Criterion) variable. The model summary reports the values of $R$, $R^2$, adjusted $R^2$ and standard error of the estimate.

**R:** $R$ is a measure of the correlation among the observed value and the predicted value of the dependent (criterion) variable.

**R Square:** $R^2$ is the square of this measure of correlation and signifies the proportion of the variance in the dependent (criterion) variable which is accounted for by our model. In essence, this is a measure of how good a prediction of the dependent (criterion) variable we can make by knowing the Independent (predictor) variables.

**Adjusted R Square:** When the value of $R$ square applied to the real world, the success of the model may has some uncertainty or doubt, so, an Adjusted R Square value is calculated which consider the number of variables in the model and the number of participants (observations) our model is based on. Thus value of Adjusted R Square ($\text{Adjusted } R^2$) gives the most useful measure of the success of our model.
So, it can be said that the value of R-Square ($R^2$) is the amount of variation in the response that is explained by the model; Adjusted $R^2$ is the adjusted value that takes into account the number of variables in the model and standard error of the estimate explain the estimated variance of the error in the model.

### 3.6.4.3 Beta (standardized regression coefficients)

The Beta value is a measure of how strongly each Independent (predictor) variable influences the Dependent (Criterion) variable. The beta is measured in units of standard deviation.

When independent variables correlate with each other, there are chances to occur a problem of multicollinearity. The problem of inter-correlation among independent (predictor) variables is known as multicollinearity and is encountered in multiple regressions which may affect the result to some extent, and hence has been to be considered properly.

### 3.6.5 Factor Analysis:

To analyze the interrelationship among large numbers of variables and to explain these variables in term of underlying dimensions, factor analysis was used as a reduction test in the present study. Since, the present study variables are multi-dimensional concepts; there was a need to examine the dimensionality of each main variable, and to define the number of dimensions that constitute each variable.

### 3.6.6 Multicollinearity:

The problem of inter-correlation among independent variables is known as Multicollinearity and is encountered in multiple regressions which may affect the result to some extent, and hence has been to be considered properly. For each independent variable, tolerance value and variance inflation factor (VIF) were used to measure the multicollinearity. If we select the option to diagnose Multicollinearity (Collinearity), SPSS results the variance inflation factor (VIF) and tolerance value.

#### 3.6.6.1 Tolerance value:

The tolerance values are a measure of the correlation between the independent variables and can vary between 0 and 1. If tolerance value is close to zero, the relationship between this variable and the other independent variables is stronger.
3.6.6.2 VIF: VIF is an alternative measure of multicollinearity (Collinearity) in which a large value indicates a strong relationship between independent (predictor) variables. Normally, a set of independent variable is highly correlated when the value of VIF surpasses ten, thus presenting a problem of multicollinearity.

Statistical calculations have been made, with the help of Microsoft excel and SPSS Version-16.0.

3.7 Limitations of the Study
An attempt has been made to complete the research work in best manner but still there are a few apparent limitations.

3.7.1 Nature of the measure used: The limitation concerns the nature of the measure used. The measures included in this research were entirely based upon the perception of the participating customers. Therefore, the potential for data inaccuracies due to item misinterpretation or predisposition to certain response on the part of the participant does exist.

3.7.2 Limited area: Responses with respect to service quality and customer satisfaction have been solicited from the customer of Direct To Home (DTH) service providers in Himachal Pradesh. Perception of people may vary for those living in other part of India.

3.7.3 Sample size: Sample size was covering only the small portion of population of DTH users in Himachal Pradesh. It may be another limitation of the study.

3.7.4 Accuracy: Accuracy in the results of a study is purely dependent upon the quality of information provided by respondents. Sometimes respondents do not provide the exact information due to various concerns like privacy and security. In the present study respondents were ensured about the confidentiality of the information provided by them but 100 percent surety of exact information may not be there.

In this chapter efforts were made to explore the different steps or sequence of various activities followed in the present research. The upcoming chapter of this dissertation explores the different results brought forward after the data analysis.